



# MATHS TREATS

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## MOUNTAINS AND ANGLES

Mountains are magical places. When asked why he was trying to climb to the top of Mt Everest, George Mallory famously replied, 'Because it's there'. Standing on the top of a very tall mountain can provide beautiful 360 degree views of the surrounds. But getting to the top requires planning and preparation.



### HOW HIGH?

You can measure the height of a person using a ruler or measuring tape. Measuring the height of a tall tree is more complicated. And measuring the height of a mountain is an outright challenge. One method which can be used is trigonometry, the branch of mathematics describing the relationship between the side lengths and angles of a triangle.

#### ACTIVITY

How many different ways can you think of to measure the height of a tree? How well would these approaches work with measuring the height of a mountain? How can trigonometry be used to measure the height of a very tall object, such as a mountain?

### HOW STEEP?

The slope of a mountainside can have a big impact. The larger the angle from the base to the peak, the steeper the mountain. And the steeper the mountain, the harder it can be to climb! When a mountain is tall enough its peak is often covered with snow in winter and sometimes all year round. However, mountains can be a dangerous place when the snow starts to slide in an avalanche.

#### ACTIVITY

How could you measure the angle of a mountainside? What range of slope angles do you think would be linked with snow avalanches? Why?

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## REFERENCES AND FURTHER READING

#### TRIGONOMETRY

<https://en.wikipedia.org/wiki/Trigonometry>  
[www.mathsisfun.com/algebra/trigonometry.html](http://www.mathsisfun.com/algebra/trigonometry.html)

#### MEASURING TALL OBJECTS

[https://en.wikipedia.org/wiki/Tree\\_height\\_measurement](https://en.wikipedia.org/wiki/Tree_height_measurement)  
[www.wikihow.com/Measure-the-Height-of-a-Tree](http://www.wikihow.com/Measure-the-Height-of-a-Tree)  
[www.saps.org.uk/attachments/article/141/SAPS\\_How\\_to\\_find\\_the\\_height\\_of\\_a\\_tree.pdf](http://www.saps.org.uk/attachments/article/141/SAPS_How_to_find_the_height_of_a_tree.pdf)  
[www.slate.com/articles/news\\_and\\_politics/explainer/2007/10/how\\_tall\\_is\\_mont\\_blanc.html](http://www.slate.com/articles/news_and_politics/explainer/2007/10/how_tall_is_mont_blanc.html)

#### AVALANCHES

[www.avalanche.net.nz/education/online-avalanche-course/--Angle.asp](http://www.avalanche.net.nz/education/online-avalanche-course/--Angle.asp)  
<https://en.wikipedia.org/wiki/Avalanche>  
<https://en.wikipedia.org/wiki/Snow>

#### IMAGES

Leadbeater possum - Steve Kuitert  
Mountains - Pixabay